The majority, in fact, must in all such questions have their way, and the existing system of chronology and its zero point (the end of B.C. 1 or of the year 0 reckoned astronomically) now so extensively pervade all history that they cannot be displaced. As regards the real date of the event on which they are nominally founded, that is another question. It seems clear that Herod the Great died in the spring of 750 by the years of Rome, corresponding to B.C. 4, and that our Lord was probably born towards the end of the preceding year, B.C. 5. Mr. Jordan refers (p. 28) to the proposal to put it back two years further, to A.D. 7, but as that theory is founded on Kepler's suggestion (which cannot be accepted) that the Star of Bethlehem was in fact a conjunction of planets, it may be dismissed as quite untenable. All who have studied mediæval writers on this subject are aware that the original proposal was to date, not from the birth, but from the incarnation of Christ, *i.e.* the Lady Day preceding the nativity; but that was soon merged in the other, which in fact superseded it. We must remind our author that astronomers when making chronological calculations do not call the vulgar era 5 B.C. (for instance) 4 B.C.; they call it A.D. –4, in the ordinary mathematical form when on the other side of the zero point.

It should be added that the book contains some interesting discussions respecting the first use of Christian chronology (superseding the era of Diocletian) and the early cycles used in the determination of Easter. In the application of a cycle there has to be taken into account not only its degree of accuracy (which is only approximate), but the date from which its use has been commenced. It is often forgotten what a twofold operation the Gregorian reformation involved; this, however, was gradually accepted in its entirety in the western church. W. T. L.

TOTEMISM AND EXOGAMY.

Social Origins. By Andrew Lang, M.A., LL.D. *Primal Law.* By J. J. Atkinson. Pp. xviii+311. (London: Longmans, Green and Co., 1903.) Price 10*s.* 6*d.* net.

MR. LANG'S critical genius has done great service to anthropology and the science of religion, and the present work, both in its criticism and constructive theory, definitely advances the study of primitive marriage and social organisation.

The essay on "primal law" deals with the origin of exogamy, and may be considered first. Its author, the late Mr. J. J. Atkinson, spent most of his life in New Caledonia, and knew the natives well. His theory, therefore, merits our careful consideration. He takes man in the semi-brutal stage, before language was evolved—living, as Darwin thought, not in hordes, but in small unsocial groups, each composed of one adult male with several wives and children. The sons of such a family would be expelled as soon as they reached maturity, owing to the fierce sexual jealousy of the father. This picture is based on what we know, little enough, of man-like apes, such as the gorilla; rightly or wrongly, evidence from cattle and other herding animals is also employed. Such, at least, according to the author, is the genesis of exogamy. He explains the well known avoidance customs between mother and son, brother and sister, as the result of the "primal law," finding a corroboration of his main point in the absence of avoidance between father and daughter. In his account of the further development he is not so successful. The theory, as a whole, is a striking one, and will have to be reckoned with, especially by those who believe in the "horde" as the first form of social organisation, and in communal "marriage" as the original type of union. We are taken so far back in the evolution of man that savage analogies can hardly be applied, and here our difficulties begin. What are the conjugal habits of the higher animals generally, and of the anthropoid apes in particular? Can zoologists give us further evidence beyond the few and possibly doubtful facts hitherto observed on which the theory is based? Another difficulty is the psychological question. We can understand *proprietary* jealousy, and an exclusion of *potential* rivals, both marital and patriarchal; but the sexual instinct of animals in a natural state is as absolutely regulated and free from excess as is that of the normal savage. With regard to the absence of avoidance in the case mentioned above, I am informed by Mr. A. W. Howitt and Prof. Baldwin Spencer that there is no evidence in Australia of such a practice as it would imply. Lastly, one is inclined to suspect single-key theories.

Mr. Lang discusses exogamy, as defined by M'Lennan, and the origin of totemism. With his usual acuteness, he fixes on essential points. In the question of exogamy, an essential phenomenon is the bisection of a tribe, as commonly in Australia, into two exogamous intermarrying moieties, which contain totem-kins; of this a luminous explanation is offered. An exogamous tendency, of whatever origin, is presupposed; then an exogamous local group, which, after the institution of totemism, finds itself composed of variously named units, owing to the presence of alien women, agrees to intermarry solely with another community similarly composed. Such is the origin of the dual phratry system. This explanation is directly opposed to the prevalent view that the bisection was deliberately arranged at a mass meeting of the primitive horde, which had at last discovered the ill effects of promiscuity. But Mr. Lang himself is bound to admit some deliberate grouping of the totems, for we never find the same in both phratries. A final theory might be expected to supply an automatic reason for this result. A more important difficulty, to my mind, is the arrangement of *connubium* between the two local groups; it does not seem clear enough why so many tribes should owe their origin to a *dual* matrimonial alliance.

The explanation of the origin of totemism is suggested by the practice, found in English and French folk-custom, and paralleled elsewhere, of "blazoning" neighbouring villages with sobriquets, which are frequently animal names. The evidence cited on this head is very interesting, and the essential fact has emerged that totem names are *group names given from without.* When accepted, they would be invested

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in time, through the action of superstition and myth, with a religious garb, and thus the marriage system would come under their influence. The theory seems to me very nearly, if not quite, to solve the mystery of totemism. There is also some good criticism of recent views, such as the origin of totemism from the "external soul," or from magical cooperative societies for the control of food.

The value of the book is increased by a clear exposition and sane criticism of the chief theories and suggestions which have been put forward in the study of totemism, exogamy, and primitive marriage.

ERNEST CRAWLEY.

OUR BOOK SHELF.

Immune Sera. Haemolysins, Cytotoxins, and Precipitins. By Prof. A. Wassermann, M.D. Translated by Charles Bolduan, M.D. Pp. ix+77. (New York: John Wiley and Sons; London: Chapman and Hall, Ltd., 1904.)

THE subject of immune sera has not in this country received as much attention from the medical profession as its importance and interest deserve. This is not so much due to the inherent difficulties of the subject as to the complicated way in which it has usually been expounded, and to the fact that the nomenclature introduced by different authors and experimenters has been found bewildering. The difficulties have been increased by the introduction by various experimenters of different terms for the same entities, and often ones which suggest the function or properties of the substance, according to the inventor's particular views.

This neglect is the more to be regretted, as investigations upon hæmolysins, cytotoxins, and precipitins which at first seemed to possess merely scientific interest, have become of the greatest importance, owing to the close analogy which has been found to obtain between these phenomena and those of natural and acquired immunity. These studies have indeed occupied an important and striking position in the development of our knowledge of the mechanisms whereby an animal protects itself, or is protected, against the invasion of the micro-organisms of infectious diseases.

This little book of seventy-five pages is an English translation of one of the "Clinical Lecture" series, edited by von Bergman. The treatment of the subject is intended for medical men generally, and is not addressed to specialists. That Prof. Wassermann is the author is sufficient guarantee that the matter has been judiciously selected, and the manner in which it is presented could hardly be improved upon, so that it forms a clear and interesting account of the subject. The main facts and principal conclusions, including a brief but adequate *résumé* of Ehrlich's development of his side-chain theory to apply to anti-bodies in general, are given, but all unnecessary controversial matter is omitted. At the end is a very select bibliography, to which the reader is from time to time referred for fuller information.

The translation is excellent, and we confidently recommend this little book to the attention of all medical men, or others, desirous of acquainting themselves with the essential and most significant facts on the subject of immune sera.

CHARLES J. MARTIN.

The Flora of the Parish of Halifax. By W. B. Crump and C. Crossland. Pp. lxxiv+316. (Halifax Scientific Society, 1904.) Price 10*s.* 6*d.* net.

THE question arises, Why should the records of a parish be amplified into a book containing 300 odd pages? in reply to which the authors explain at the outset that the parish of Halifax covers 129 square miles, and corresponds to a natural geographical division, through which flows the River Calder. But although the area is circumscribed and the vertical range is not great—the altitude varies between 500 and 1500 feet—the number of plants found within the district forms a good list, which has been worked up into an attractive historical and ecological account, and in addition, owing to the cooperation of other workers, it has been possible to include lists of all the cryptogamic plants. Looking at the plant associations, the mixed deciduous woods are the habitat of the globe-flower, the bird's nest orchid, the helleborine and the daffodil, while among the rare species of the heather moors are reckoned the bog-bell, the winter greens, and the bear berry. The bryologist, too, will find a good hunting ground, for, in addition to a fairly rich flora, the parish has yielded a new variety of Philonotis, the first record in Yorkshire for *Amblystegium Juratzkae,* and one of the few stations in the British Isles for *Jubula Hutchinsiae.* With the botany of Halifax is inseparably bound up the name of John Bolton, painter and naturalist, who in 1785 published "Filices Brittanicæ," with thirty-one copper plates all drawn by himself, and in 1791 completed "An History of Fungusses," also provided with plates, and the extent of his collections can be gauged from the numerous records which are given in the book.

While this "Flora" must naturally prove most useful to those who can traverse the parish, the ecological account and the records will serve for guidance and reference to a larger number of naturalists.

Chemisches Praktikum. By Dr. A. Wolfrum. II. Teil. Präparative und Fabrikatorische Übungen. Pp. xii+580. Price 15*s.* net. Atlas, Part ii. Atlas, price 1*l.* net; together, price 1*l.* 8*s.* net. (Leipzig: Engelmann, 1903.)

WE gather from the preface to the first part that the author's intention in compiling this work was to present the student whose aims lie in the direction of chemical technology with a course of practical exercises especially fitted for his future career. The first volume dealt with analytical work, and here the student is introduced to preparative chemistry.

The first chapter is devoted to a discussion of general matters, such as the treatment of materials for preparative and technical purposes, the general conditions of chemical reaction, and the separation, purification, and testing of reaction products. In the second chapter of 150 pages, the methods of preparation of a large number of inorganic and organic substances are described. Fifteen pages form the third chapter, which deals with the dynamics of chemical reactions, and the last two chapters are devoted to matters of a specially technical nature—descriptions of furnaces, autoclaves, filter-presses, air-pumps, condensers, centrifuges, &c., the fitting up of factories, book-keeping, patent laws, and, finally, exercises in connection with large scale technical processes are given.

Such is the programme arranged by the author for the future works chemist. It must be admitted that in many cases the practical courses provided at the universities and higher technical institutions for such chemical students might be with advantage considerably modified; in most cases the chief difficulty confronting such change is to be found in the greatly increased cost of laboratory equipment and upkeep. Without such equipment it is questionable whether the "Chemisches Praktikum" can be advantageously used by the technical student. The preparations are well chosen, but the working details would have been far more intelligible to the average student if

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